



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of:
Eric Michael Breitung et al.

Serial No.: 10/630,139

Filed: July 31, 2003

For: DELIVERY SYSTEM FOR PECVD
POWERED ELECTRODE

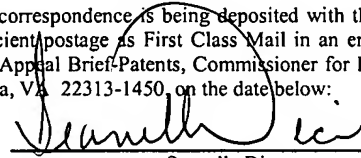
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Group Art Unit: 1763

Examiner: Zervigon, Rudy

Atty. Docket: 121277-1/YOD/WOL
GERD:0598

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APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on November 20, 2006, and received by the Patent Office on November 24, 2006.

The Commissioner is authorized to charge the requisite fee of \$500.00, and any additional fees which may be necessary to advance prosecution of the present application, to Account No. 07-0868, Order No. 121277-1/YOD (GERD:0598).

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1. **REAL PARTY IN INTEREST**

The real party in interest is General Electric Company, the Assignee of the above-referenced application by virtue of the Assignment to General Electric Company, recorded at reel 014355, frame 0280, and dated July 31, 2003. Accordingly, General Electric Company will be directly affected by the Board's decision in the pending Appeal.

2. **RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants' legal representative in this Appeal.

3. **STATUS OF CLAIMS**

Claims 1-18 are currently pending and under final rejection and, thus, are the subject of this Appeal. Claims 19-31 were earlier cancelled.

4. **STATUS OF AMENDMENTS**

There are no outstanding amendments to be considered by the Board.

5. **SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention relates generally to gas delivery systems for PECVD reactors and methods for using such systems. *See* Application, pages 3-4, paragraph 10. The delivery system may include a coupling device enabling the system to go directly through the powered electrode of the PECVD reactor. *See id.* Additionally, the delivery system may be electrically and thermally isolated from the powered electrode and sealed to maintain the vacuum integrity of the PECVD reactor. *See id.* Moreover, the gas line of the delivery system may be heated thereby eliminating any cold areas between the showerhead of the PECVD reactor and the gas inlet line. *See id.*

The Application contains 3 independent claims, namely, claims 1, 9, and 15, all of which are the subject of this Appeal. The subject matter of these claims is summarized below.

With regard to the aspect of the invention set forth in independent claim 1, discussions of the recited features of claim 1 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to a delivery device (*e.g.*, 100) for a thin film deposition or etching apparatus (*e.g.*, 112). *See, e.g., id.* at page 6, paragraph 19; *see also*, FIG. 2. The delivery device (*e.g.*, 100) includes a heated gas inlet line (*e.g.*, 142) for delivering a gas (*e.g.*, 128) to a powered electrode (*e.g.*, 116) of the apparatus (*e.g.*, 112). *See, e.g., id.* at page 6, paragraphs 19-20; *see also*, page 7, paragraph 24; *see also*, FIGs. 2-3. The gas inlet line (*e.g.*, 142) is maintained under a vacuum. *See, e.g., id.* at page 7, paragraph 25. Further, the delivery device (*e.g.*, 100) includes a coupling device (*e.g.*, 200) located between the powered electrode (*e.g.*, 116) and the gas inlet line (*e.g.*, 142). *See, e.g., id.* at page 7, paragraphs 24-25; *see also*, FIGs. 2-3. The coupling device (*e.g.*, 200) includes an insulation portion (*e.g.*, 205). *See, e.g., id.* at page 8, paragraph 26; *see also*, FIG. 3.

With regard to the aspect of the invention set forth in independent claim 9, discussions of the recited features of claim 9 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to a delivery device system (*e.g.*, 100) for delivering a gas (*e.g.*, 128) to a thin film deposition or etching apparatus (*e.g.*, 112). *See, e.g., id.* at page 6, paragraphs 19-20; *see also*, FIG. 2. The system (*e.g.*, 100) includes a heated gas inlet line (*e.g.*, 142) maintained under a vacuum and a coupling device (*e.g.*, 200) located between a powered electrode (*e.g.*, 116) of the apparatus (*e.g.*, 112) and the gas inlet line (*e.g.*, 142). *See, e.g., id.* at page 6, paragraphs 19-20; *see also*, page 7, paragraphs 24-25; *see also*, FIGs. 2-3. The coupling device includes thermal and

electrical insulation portion (*e.g.*, 205). *See, e.g., id.* at page 8, paragraph 26; *see also*, FIG. 3.

With regard to the aspect of the invention set forth in independent claim 15, discussions of the recited features of claim 15 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to a PECVD apparatus containing a delivery system (*e.g.*, 100). *See, e.g., id.* at page 5, paragraph 18; *see also*, page 6, paragraph 19; *see also*, FIG. 2. The system includes a heated gas inlet line (*e.g.*, 142) maintained under a vacuum and a coupling device (*e.g.*, 200) located between a powered electrode (*e.g.*, 116) of the PECVD apparatus and the gas inlet line (*e.g.*, 142). *See, e.g., id.* at page 6, paragraphs 19-20; *see also*, page 7, paragraphs 24-25; *see also*, FIGs. 2-3. The coupling device includes insulation portion (*e.g.*, 205) and flange device (*e.g.*, 207) for maintaining the gas inlet line (*e.g.*, 142) under a vacuum. *See, e.g., id.* at page 8, paragraph 26; *see also*, FIG. 3.

A benefit of the invention, as recited in these claims, is the ability to delivery gas to the apparatus via a heated gas inlet line. *See, e.g., id.* at page 7, paragraphs 24-25. The configuration of the system and the heated gas inlet line enable a gas mixture to enter the chamber without having to pass through an unheated area between the showerhead of the PECVD reactor and the gas inlet line. *See, e.g., id.* at pages 3-4, paragraph 10. This helps to prevent the gas mixture from condensing and clogging the gas inlet line, which may occur if the gas is passed through an unheated or cooled area. *See, e.g., id.* at page 3, paragraph 8. Furthermore, embodiments of the present invention provide that the gas is delivered directly through the power electrode, thus eliminating additional cold spots like the corners illustrated in FIG. 1. *See, e.g., id.* at page 3, paragraph 8; *see also*, pages 3-4, paragraph 10; *see also*, FIGs. 1-3.

The pending claims are clearly distinct from the prior art, as discussed below.

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Sole Ground of Rejection for Review on Appeal:

Appellants respectfully urge the Board to review and reverse the Examiner's rejection on claims 1-18 under 35 U.S.C. § 102 (b) as being anticipated by Countrywood et al. (U.S. patent no. 6,110,540 A, hereinafter, "Countrywood"). Of these, claims 1, 9 and 15 are independent.

7. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Section 102. Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants strongly believe that claims 1-18 are currently in condition for allowance.

A Legal Precedent

Anticipation under Section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under Section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). The prior art reference also must show the *identical* invention "*in as complete detail as contained in the ... claim*" to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). Accordingly, Appellants may point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter.

B. Independent claims 1, 9 and 15: Countrywood fails to disclose the heated gas inlet line element.

All of the independent claims recite, in generally similar language, a heated gas inlet line for delivering a gas to a powered electrode. Countrywood does not disclose or even suggest the claimed element of *a heated gas inlet line*. Instead, Countrywood only discloses a gas supply that is used in conjunction with the apparatus. *See, e.g.*, Countrywood at column 4, lines 45-47; *see also*, column 4, lines 61-63; *see also*, column 5, lines 47-50.

Furthermore, Countrywood actually teaches away from a heated gas inlet line by disclosing a cooling system at the gas inlet. *See, e.g., id.* at column 3, lines 3-5; *see also*, column 5, lines 51-53; *see also*, FIG. 2A, items 36 and 38. A cooling water system at the gas inlet would only defeat the purpose of a heated gas inlet line and would present the cold areas the heated gas inlet line eliminates. *See* Application, pages 3-4, paragraph 10. These cold areas are problematic because they allow the gas to condense and clog the gas inlet. *See, e.g., id.* at page 3, paragraph 8. Thus, the cold area (*i.e.*, the cooling system) disclosed in Countrywood would specifically counteract the heated gas inlet line element, and thus, can only be interpreted as explicitly teaching away from the claimed element of a heated gas inlet line.

Furthermore, the Examiner's rejection further illustrates the deficiencies in Countrywood because the Examiner failed to find support for this claimed element. In the final office action, the Examiner stated the following regarding claim 1:

Countrywood teaches a delivery device (Figure 3B; column 6; line 34 – column 6 [sic], line 23) for a thin film deposition or etching apparatus (Figure 1; column 6; lines 35-48), comprising: *a heated gas* (120; Figure 3B) *inlet line* (conduit for gas from 120; Figure 3B; column 6; line 34 – column 6 [sic], line 23) for delivering *a gas* (120; Figure 3B)...

See Final Office Action mailed July 19, 2006, page 3, item 4 (emphasis added).

It appears that the Examiner incorrectly interpreted the claim language and divided the single element of “a heated gas inlet line” into two separate elements. That is, the Examiner treated the claim as having “a heated gas” element, and “an inlet line” element. Clearly, this is not a reasonable interpretation of the claim language because “a heated gas inlet line” is not both “a heated gas” and “an inlet line”. Furthermore, claim 1 establishes proper antecedent basis for the element by reciting “*a heated gas inlet line* for delivering *a gas*.” See Application, claim 1, line 3 (emphasis added). Moreover, the disclosure states that “[t]he system 100 supplies inlet gases directly into the powered electrode 116 and allows heating of *the entire gas inlet line* 142 including in areas near the powered electrode 116.” See *id.* at page 6, paragraph 19 (emphasis added).

Additionally, the specification of the present application states the benefits of heating the entire gas line in order to eliminate cold areas between the showerhead and the gas inlet line. See, e.g., *id.* at pages 3-4, paragraph 10. Thus, basic claim construction, as well as the specification, would lead one skilled in the art to conclude that *a heated gas inlet line* is a single element and not two separate elements as interpreted by the Examiner.


Moreover, Countrywood specifically teaches away from this element, and thus, cannot anticipate the claimed element. The Examiner made the same incorrect interpretation for independent claims 9 and 15. As such, Countrywood does not disclose all of the claimed features of dependent claims 1, 9, and 15. Accordingly, Appellants respectfully assert that Countrywood does not anticipate independent claims 1, 9, and 15, as well as the claims that depend therefrom.

Conclusion

Appellants respectfully submit that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: January 24, 2007



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8. **APPENDIX OF CLAIMS ON APPEAL**

Listing of Claims:

1. A delivery device for a thin film deposition or etching apparatus, comprising:
a heated gas inlet line for delivering a gas to a powered electrode of the apparatus, the gas inlet line maintained under a vacuum; and
a coupling device located between the powered electrode and the gas inlet line, the coupling device comprising an insulation portion.
2. The device of claim 1, wherein the gas inlet line is directly connected to the coupling device.
3. The device of claim 2, wherein the coupling device is directly connected to the powered electrode.
4. The device of claim 1, wherein the thin film deposition or etching apparatus comprises a PECVD apparatus.
5. The device of claim 1, wherein the insulation portion is both thermally and electrically insulating.
6. The device of claim 1, wherein the insulation portion comprises a plastic or a ceramic material.

7. The device of claim 3, wherein the coupling device further comprises a flange for maintaining the gas inlet line under a vacuum.

8. The device of claim 7, wherein the flange is connected to the gas inlet line, the insulation portion is connected to the powered electrode, and the insulation portion and flange are connected to each other.

9. A delivery device for delivering a gas to a thin film deposition or etching apparatus, the system comprising:

a heated gas inlet line maintained under a vacuum; and

a coupling device located between a powered electrode of the apparatus and the gas inlet line, the coupling device comprising thermal and electrical insulation portion.

10. The device of claim 9, wherein the gas inlet line is directly connected to the coupling device.

11. The device of claim 10, wherein the coupling device is directly connected to the powered electrode.

12. The device of claim 9, wherein the electrical insulation portion comprises a plastic or a ceramic material.

13. The device of claim 11, wherein the coupling device further comprises a flange for maintaining the gas inlet line under a vacuum.

14. The device of claim 13, wherein the flange is connected to the gas inlet line, the insulation portion is connected to the powered electrode, and the insulation portion and flange are connected to each other.

15. A PECVD apparatus containing a delivery system, the system comprising:

a heated gas inlet line maintained under a vacuum; and
a coupling device located between a powered electrode of the PECVD apparatus and the gas inlet line, the coupling device comprising insulation portion and flange device for maintaining the gas inlet line under a vacuum.

16. The device of claim 15, wherein the gas inlet line is directly connected to the coupling device and the coupling device is directly connected to the powered electrode.

17. The device of claim 15, wherein the insulation portion is both thermally and electrically insulating.

18. The device of claim 16, wherein the flange is connected to the gas inlet line, the insulation portion is connected to the powered electrode, and the insulation portion and flange are connected to each other.

9. **EVIDENCE APPENDIX**

None.

10. **RELATED PROCEEDINGS APPENDIX**

None.